

IN THE CLAIMS

1. **(currently amended)** A label switching router that carries out multiprotocol label switching (MPLS) on an internet protocol (IP) network, comprising said label switching router ~~signaling-transmitting a failure message~~ to another label switching router having an IP address indicating two or more stages upstream in a label switched path (LSP) on a working path, when a signal from a reception link in the LSP is no longer detected,

wherein a control LSP is set up, and the label switching router ~~signals-transmits the failure message to the another label switching router by transmitting a message on using the control LSP, and~~

wherein the failure message includes LSPs passing traffic on the working path to be switched to a recovery path, the LSPs being processed as a protection group.

2. **(currently amended)** A label switching router that carries out multiprotocol label switching (MPLS) on an internet protocol (IP) network, comprising a path switching label switching router (PSL) that switches from a working path to a recovery path, the PSL selecting another label switching router having an IP address indicating two or more stages downstream when the PSL receives a failure message via a control label switched path (LSP), the other label switching router serving as a path merging label switching router (PML) that receives signals from both the working path and the recovery path,

wherein the failure message includes LSPs passing traffic on the working path to be switched to the recovery path, the LSPs being processed as a protection group.

3. **(currently amended)** The label switching router as claimed in claim 2, wherein a ~~control label switched path (LSP) is set up, the control LSP being~~ is in a direction opposite to the working path that goes from the PSL to the PML.

4. (previously presented) The label switching router as claimed in claim 3, wherein messages transmitted on said control LSP, when switching is to be carried out, comprise a message type, an IP address of a transmitting label switching router, and information about a plurality of LSPs that are transmitting traffic on the working path that is to be switched.

5. (previously presented) The label switching router as claimed in claim 4, wherein said LSPs are grouped into a unit for switching from the working path to the recovery path, if said LSPs are passing traffic on the same working path from a specific PSL to a specific PML.

6. (previously presented) The label switching router as claimed in claim 5, wherein said unit of said LSPs is further divided into groups for every quality of service (QoS) and class of service (CoS) for switching from the working path to the recovery path, if the QoS and the CoS are set up in the working path.

7. (original) The label switching router as claimed in claim 5, wherein the number of said LSPs and identifiers of said LSPs that are to be switched to the recovery path are provided from said PSL to said PML, and the recovery path is set up in a package by receiving a signal from said PML.

8. (original) The label switching router as claimed in claim 7, wherein the recovery path for a section from said PSL to said PML prepared for said unit assigns a label only for the section using label stacking for forwarding.

9. (original) The label switching router as claimed in claim 5, wherein a label processing unit stores information concerning said working path and said recovery path such that said PSL is capable of switching traffic to the recovery path, and switching back to the working path.

10. (original) The label switching router as claimed in claim 5, wherein the label processing unit stores an entry of each of the working path and the recovery path, such that the label for the recovery path of a frame on the recovery path, received by the PML, is removed, and mapping to the working path can be performed.

11. **(currently amended)** A restoration and protection method for carrying out label switching in a label switching network having a plurality of label switching routers, comprising a step wherein one or more of said label switching routers ~~signals~~ transmits a failure message to another label switching router having an internet protocol (IP) address indicating two or more stages upstream in a label switched path (LSP) on a working path, when a signal from a reception link in the LSP is no longer detected,

wherein a control LSP is set up, and the one or more label switching router ~~signals~~ transmits the failure message to the another label switching router ~~by transmitting a message~~ causing the control LSP, and

wherein the failure message includes LSPs passing traffic on the working path to be switched to a recovery path, the LSPs being processed as a protection group.

12. **(currently amended)** A restoration and protection method that realizes multiprotocol label switching (MPLS) on an internet protocol (IP) network, comprising a step wherein a path switching label switching router (PSL) switches from a working path to a

recovery path selecting another label switching router having an IP address indicating two or more stages downstream when the PSL receives a failure message via a control label switched path (LSP), said other label switching router serving as a path merging label switching router (PML) that receives signals from both the working path and the recovery path,

wherein the failure message includes LSPs passing traffic on the working path to be switched to the recovery path, the LSPs being processed as a protection group.

13. **(currently amended)** The restoration and protection method as claimed in claim 12, further comprising a step wherein ~~a control label switched path (LSP) is set up, the control LSP being~~ is in a direction opposite to the working path that goes from the PSL to the PML.

14. (previously presented) The restoration and protection method as claimed in claim 13, further comprising a step wherein messages transmitted on said control LSP, when switching is to be carried out, comprise a message type, an IP address of a transmitting label switching router, and information about a plurality of LSPs that are transmitting traffic on the working path that is to be switched.

15. (previously presented) The restoration and protection method as claimed in claim 14, further comprising a step wherein said LSPs are grouped into a unit for switching from the working path to the recovery path, if said LSPs are passing traffic on the same working path from a specific PSL to a specific PML.

16. (previously presented) The restoration and protection method as claimed in claim 15, further comprising a step wherein said unit of said LSPs is further divided into groups for every quality of service (QoS) and class of service (CoS) for switching from the working path to the recovery path, if the QoS and the CoS are set up in the working path.

17. (original) The restoration and protection method as claimed in claim 15, further comprising a step wherein the number of said LSPs and identifiers of said LSPs that are to be switched to the recovery path are provided from said PSL to said PML, and the recovery path is set up in a package by receiving a signal from said PML.

18. (original) The restoration and protection method as claimed in claim 17, further comprising a step wherein the recovery path for a section from said PSL to said PML prepared for said unit assigns a label only for the section using label stacking for forwarding.

19. (original) The restoration and protection method as claimed in claim 15, further comprising a step wherein a label processing unit stores information concerning said working path and said recovery path such that said PSL is capable of switching traffic to the recovery path, and switching back to the working path.

20. (original) The restoration and protection method as claimed in claim 15, further comprising a step wherein the label processing unit stores an entry of each of the working path and the recovery path, such that the label for the recovery path of a frame on the recovery path, received by said PML, is removed, and mapping to the working path can be performed.

21. **(currently amended)** A router that transmits a label corresponding to an addressed network, receives another label, sets up a label path by updating a routing table that contains the received label based on the received label, and transmits a packet only with reference to a label that corresponds to a low level header of an internet protocol (IP) packet header to the label path, comprising said router transmitting a failure notice to another router that is positioned two or more stages upstream on said label path on a working path, when packets are no longer received through said label path, wherein a control label switched path (LSP) is set up, and the router transmits the failure notice to the another router ~~enusing~~ the control LSP, and wherein the failure notice includes LSPs passing traffic on the working path to be switched to a recovery path, the LSPs being processed as a protection group.